

ECS SDP Internal Training

Objectives



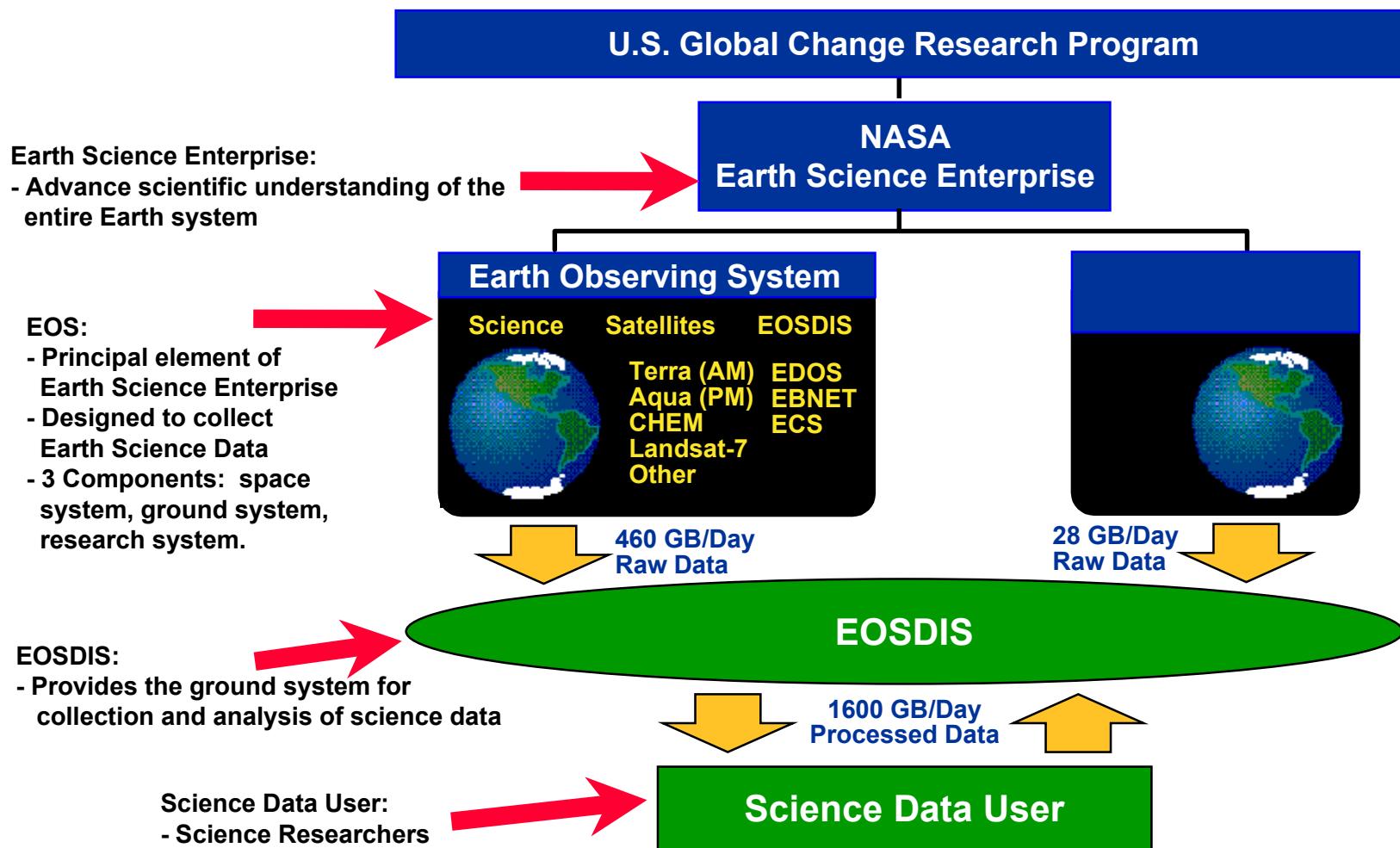
- **Overall objective: Describe ECS structure and function for Science Data Processing (SDP)**
 - Identify subsystems and Computer Software Configuration Items (CSCIs)
 - Specify major components and functions/processes of CSCIs
 - Describe role of CSCIs/functions/processes in the context of ECS operational scenarios
 - ASTER-specific functions (e.g., DAR, expedited data support)
 - Producing and distributing data products (including media)
 - Updating QA metadata
 - On-demand processing workaround
 - User registration
 - Landsat data insertion and access

What This Lesson Is (and Is Not)

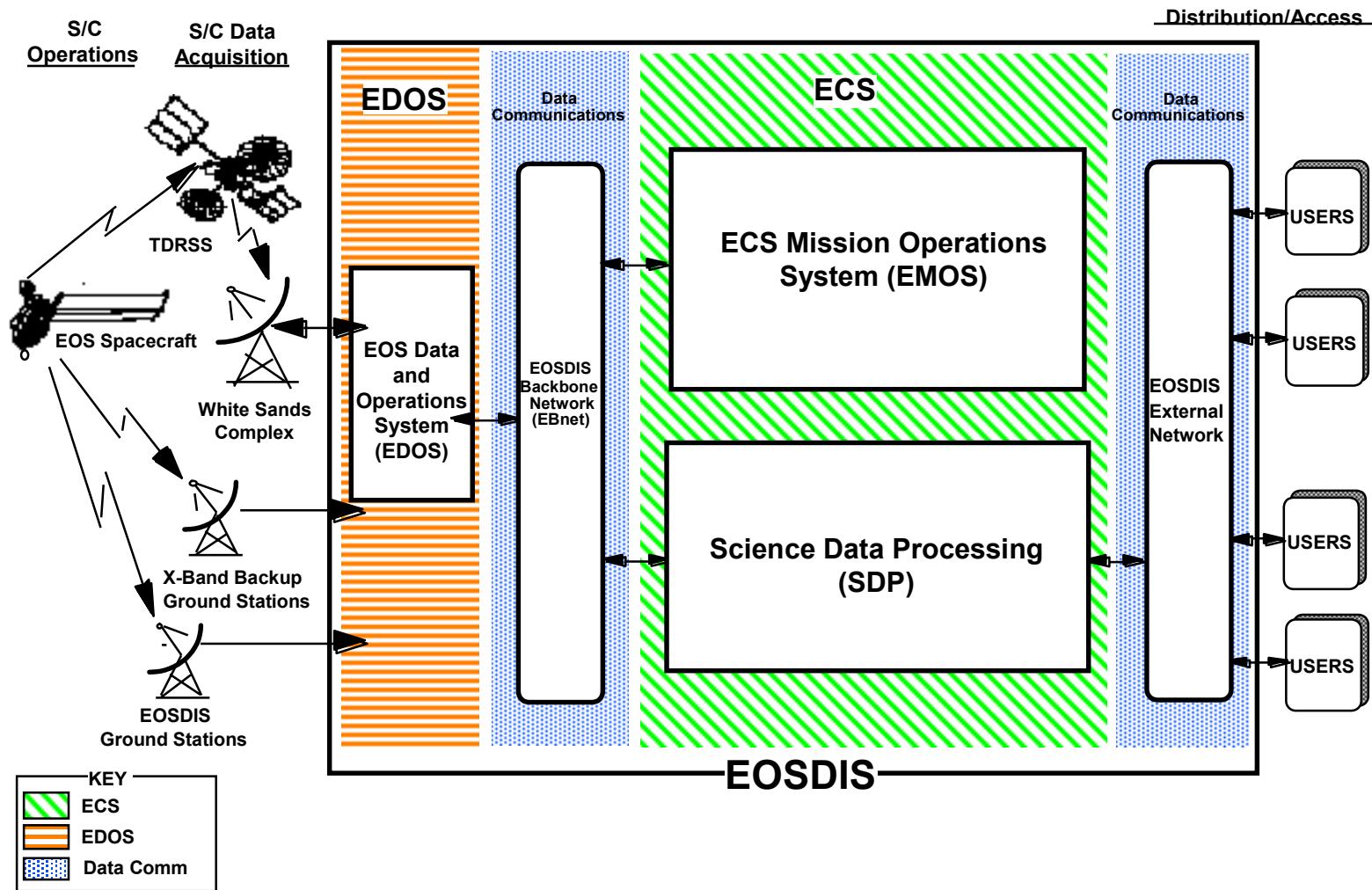


- **Is**
 - Brief illustration of ECS high-level structure
 - Introduction to subsystems that make up ECS at a site
 - Examination of each subsystem and its Computer Software Configuration Items (CSCIs), with components
 - Introduction of all system elements and brief description of functions
 - Background for subsequent scenario-based presentation of system functional flows
 - Detailed look at system functioning in the context of operational scenarios
- **Is Not**
 - Full description of overall ECS structure and function
 - Description of specific individual ECS entities (e.g., SMC)
 - Software development lesson
 - Complete description of interfaces and event sequences
 - Operations training

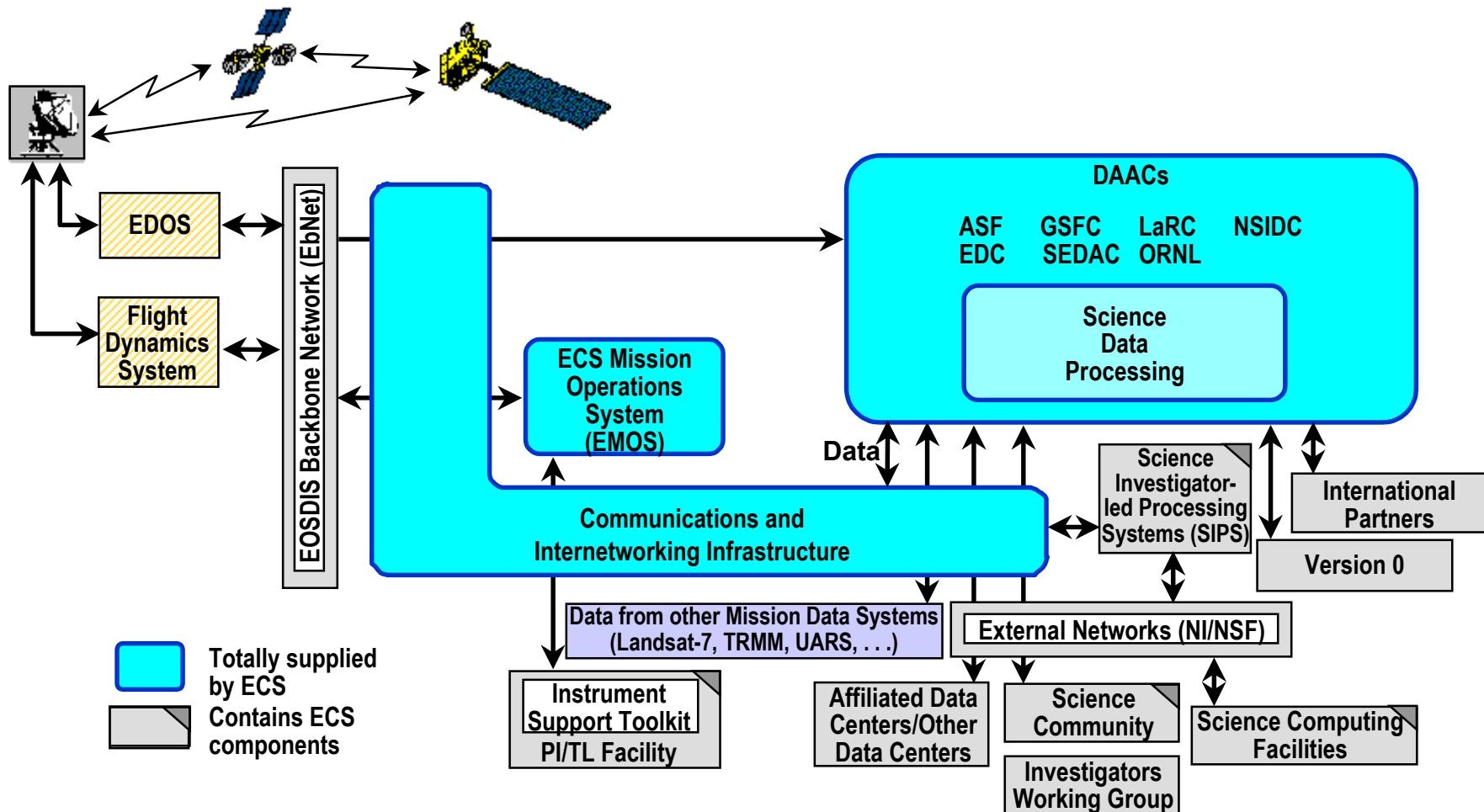
Program Overview



EOSDIS Principal Components



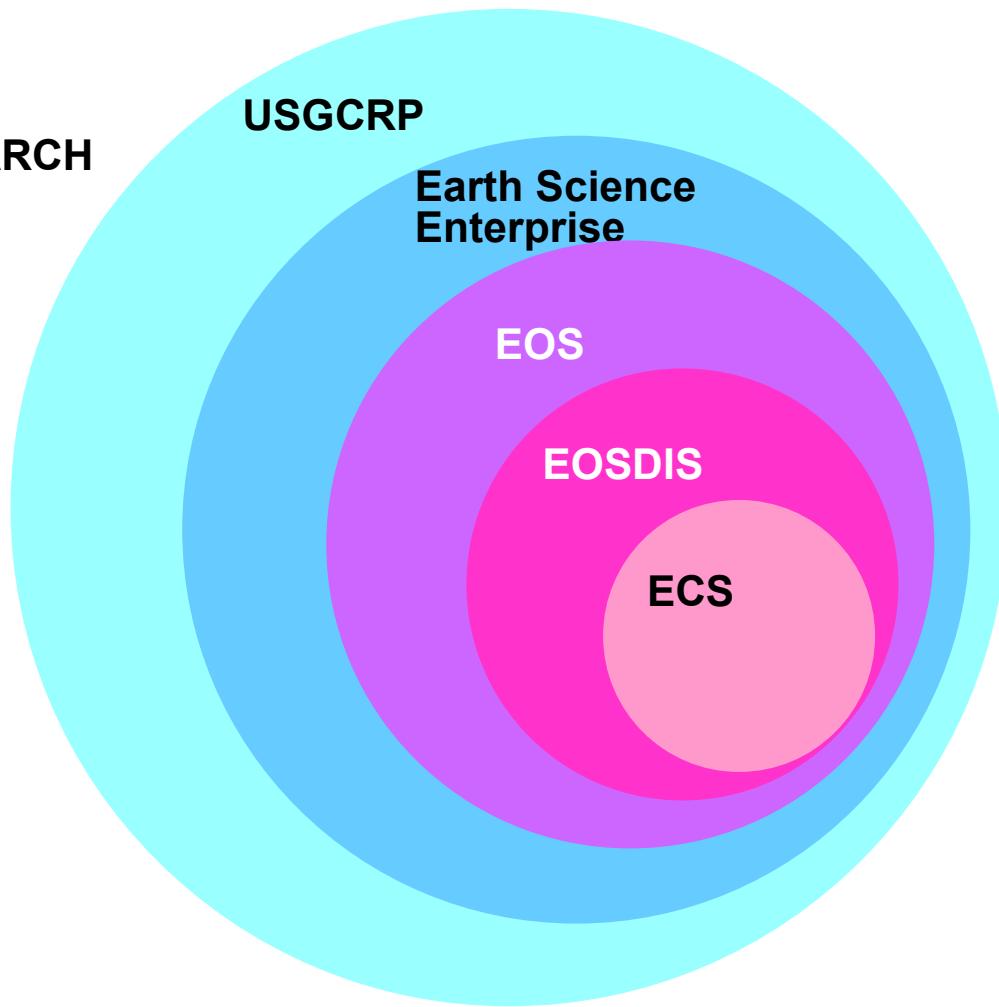
EOSDIS Data Flow



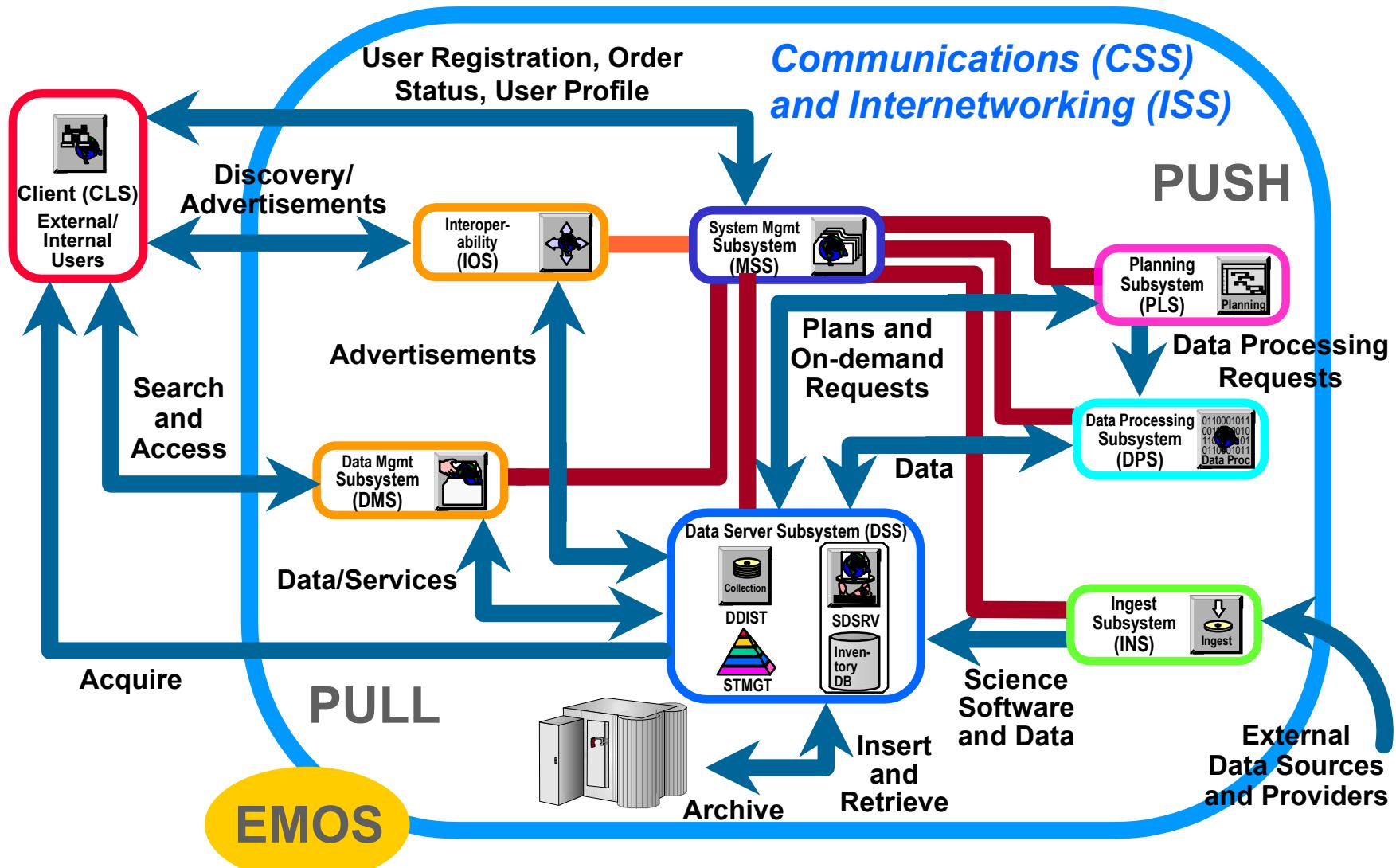
Relationship of ECS to Global Change Research



WORLDWIDE
GLOBAL CHANGE RESEARCH



ECS Context



Subsystems and Functions



Science Data Processing Segment (SDPS)

- **Data Server Subsystem (DSS)**
 - Data storage and management: archive science data (with related insert, search and retrieve functions), archive management, data resource staging
- **Ingest Subsystem (INS)**
 - Interface with external data providers and transfer data into ECS (with related staging functions and operator interfaces)
- **Data Processing Subsystem (DPS)**
 - Dispatches and monitors execution of science software
- **Planning Subsystem (PLS)**
 - Long- and short-term planning of science data processing, and management of production resources

Subsystems and Functions (Cont.)



SDPS (Cont.)

- **Client Subsystem (CLS)**
 - Provides interfaces and access for external users
- **Data Management Subsystem (DMS)**
 - Enables cross-site data search and retrieval; gateways for interface of ECS with EOS Data Gateway Web Client (Version 0 IMS) protocol
- **Interoperability Subsystem (IOS)**
 - Advertising Service; support for other subsystems in locating data or DSS services

Subsystems and Functions (Cont.)

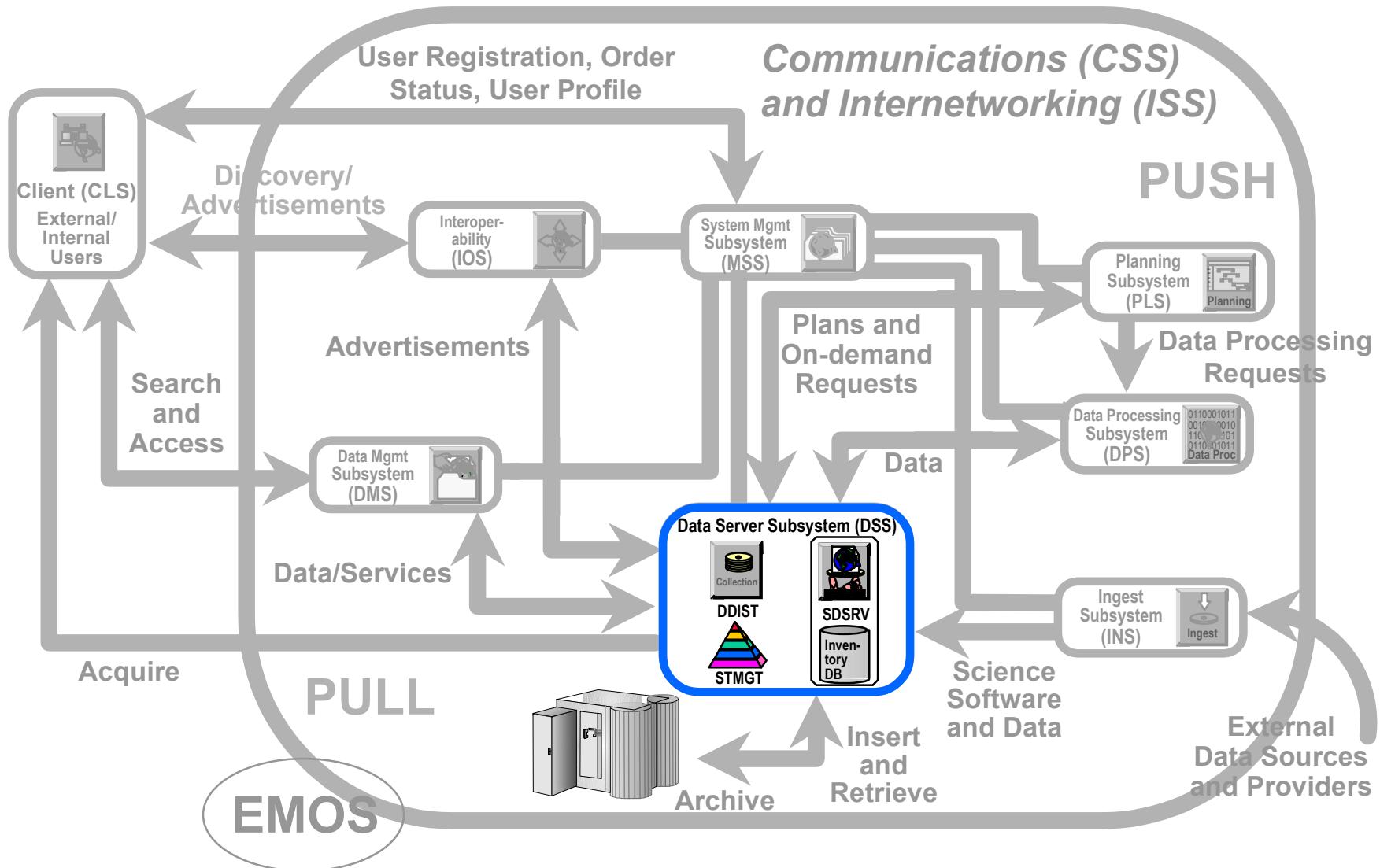


Communications and System Management Segment (CSMS)

- **System Management Subsystem (MSS)**
 - System maintenance, management, and administration (includes trouble ticketing, baseline and configuration management, fault and performance monitoring, and user account management and order tracking)
- **Communications Subsystem (CSS)**
 - General system infrastructure functions (includes DCE and network communications, libraries to standardize software mechanisms, application error handling, interfaces to e-mail, file transfer and network file copy functions)
- **Internetworking Subsystem (ISS)**
 - Networking hardware devices and embedded software

NOTE: The ISS is part of the ECS infrastructure and is not addressed in detail in this course.

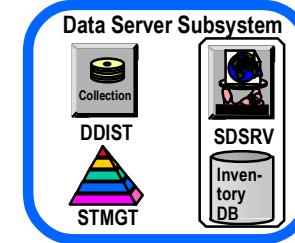
Subsystems and CSCIs: DSS



Subsystems and CSCIs: DSS (Cont.)



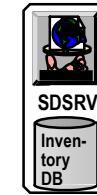
- **Data Server Subsystem (DSS)**
 - Provides capabilities to store, search, retrieve, and distribute earth science and related data
 - Client-server information transfer is by commands and requests
 - Generates Universal References to identify ECS entities
 - GranuleUR: represents a granule in the data server (e.g., as follows)



UR:10:DsShESDTUR:UR:15:DsShSciServerUR:13:[GSF:DSSDSRV]:16:SC:MOD10_L2:1411

- DsServerUR: represents a specific running data server application (e.g., [GSF:DSSDSRV])
- Uses MSS Event services to log system-level events
- Interfaces with virtually all ECS subsystems and components
- Uses several COTS tools: RogueWave tools and libraries, Sybase relational database, Spatial Query Server

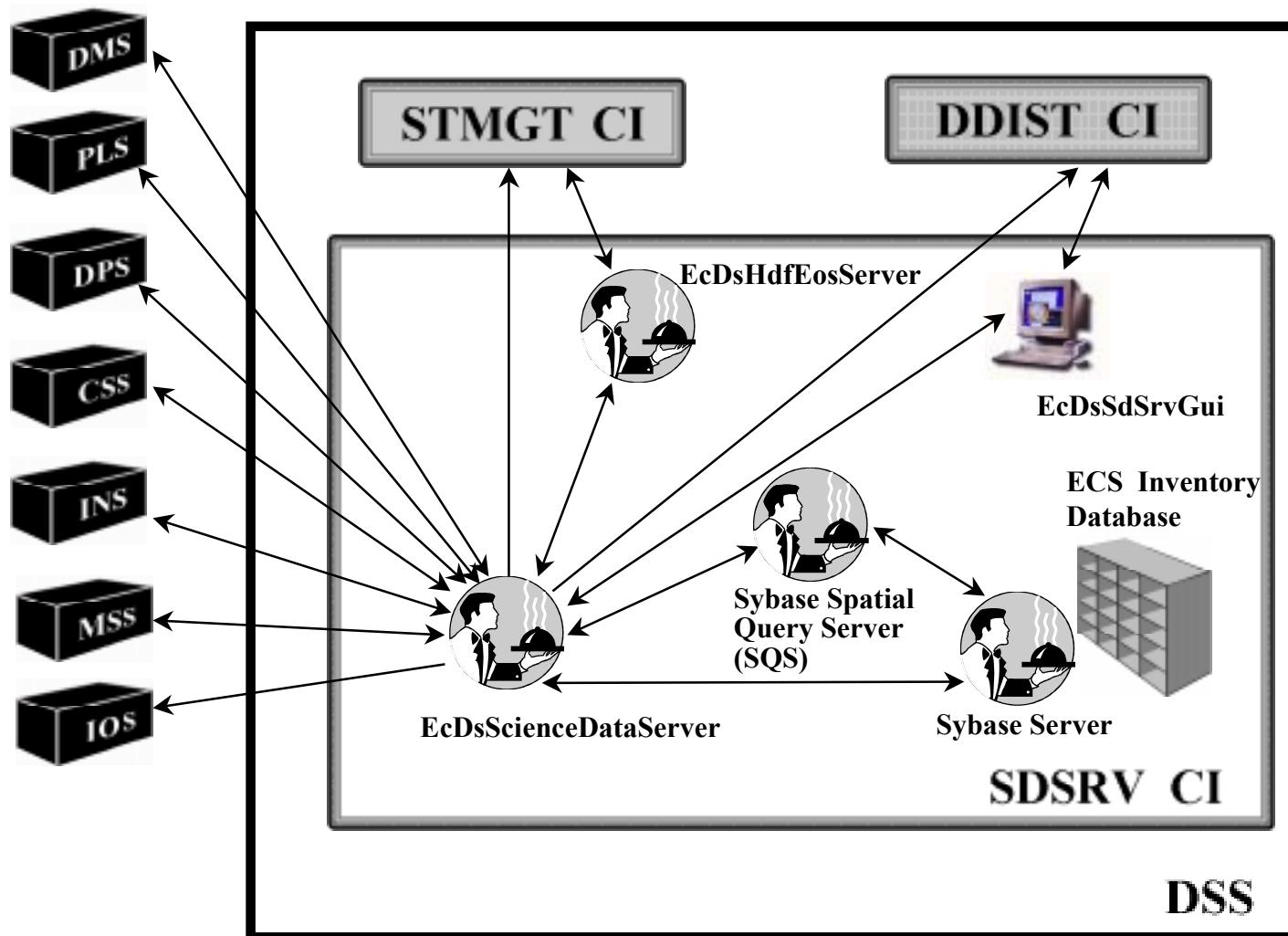
Subsystems and CSCIs: DSS (Cont.)



- **Science Data Server (SDSRV) CSCI**
 - Provides the ECS with a catalog of Earth Science Data holdings, and the Earth Science Data Type (ESDT) services that operate on the data
 - Manages and provides user access to data collections through its catalog of metadata and mechanisms to acquire data from the archive
 - Four major components
 - **Science Data Server** - services requests for storage, search, retrieval, and manipulation of science data
 - **HDF EOS Server** - provides science data subsetting
 - **Science Data Server GUI** - provides operator interface
 - **Sybase/SQS Server** - manages catalog (metadata)

Subsystems and CSCIs: DSS (Cont.)

SDSRV Architecture and Interfaces



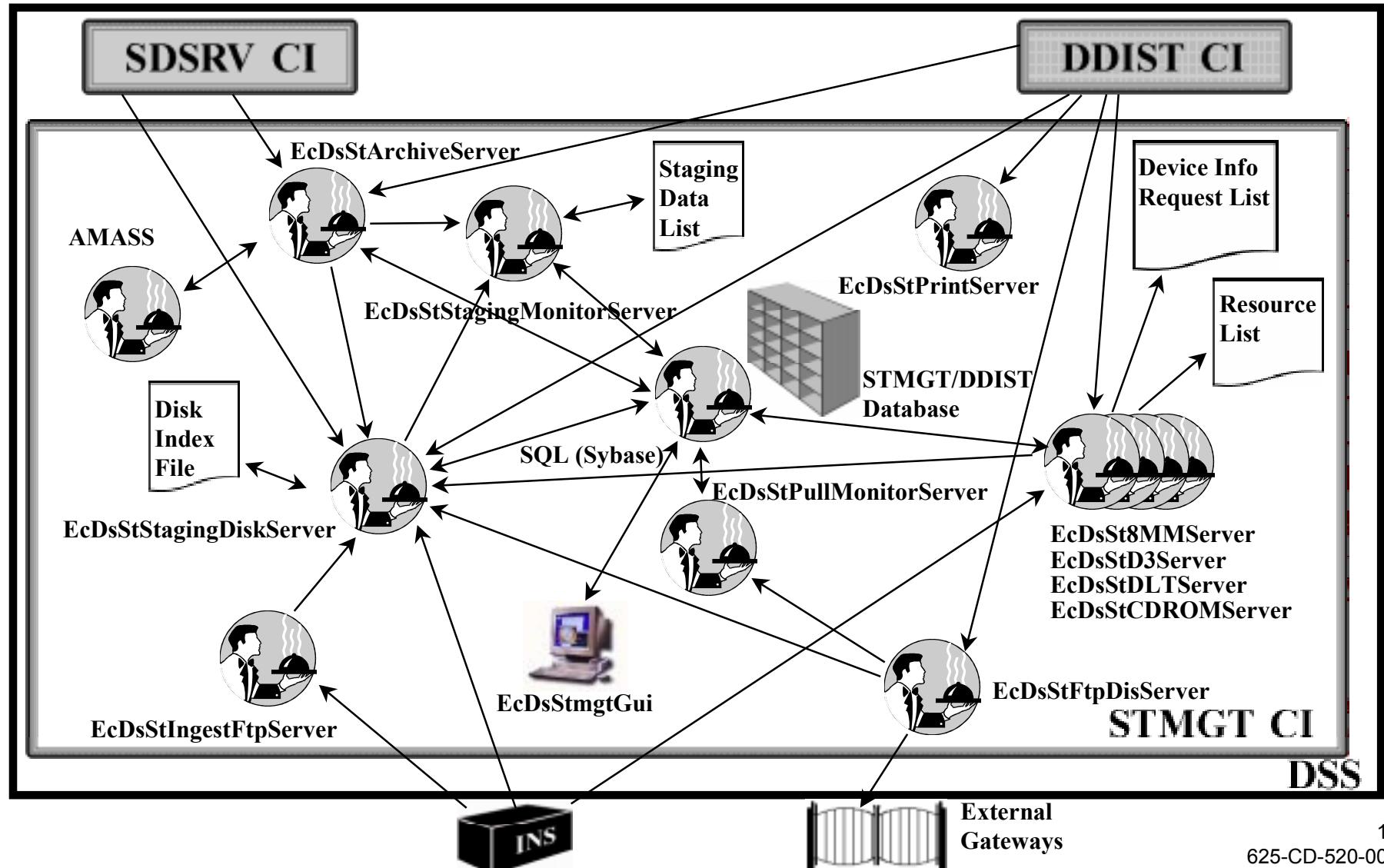
Subsystems and CSCIs: DSS (Cont.)



- **Storage Management (STMGT) CSCI**
 - Stores, manages, and retrieves data files on behalf of other science data processing components
 - Five major components
 - **Archive Server** - provides GUI and access to stored data
 - **Staging Monitor** - manages the group of data files that have been retrieved from the archive and placed into a cache area on staging disk
 - **Resource Manager** - schedules access to shared peripheral devices
 - **Pull Monitor** - manages files in the user pull area, deleting them as they are retrieved by users or as their time-out periods expire
 - **Data Base** - contains data tables for STMGT devices, cache management, event and log management, requests, and related functions

Subsystems and CSCIs: DSS (Cont.)

STMGT Architecture and Interfaces



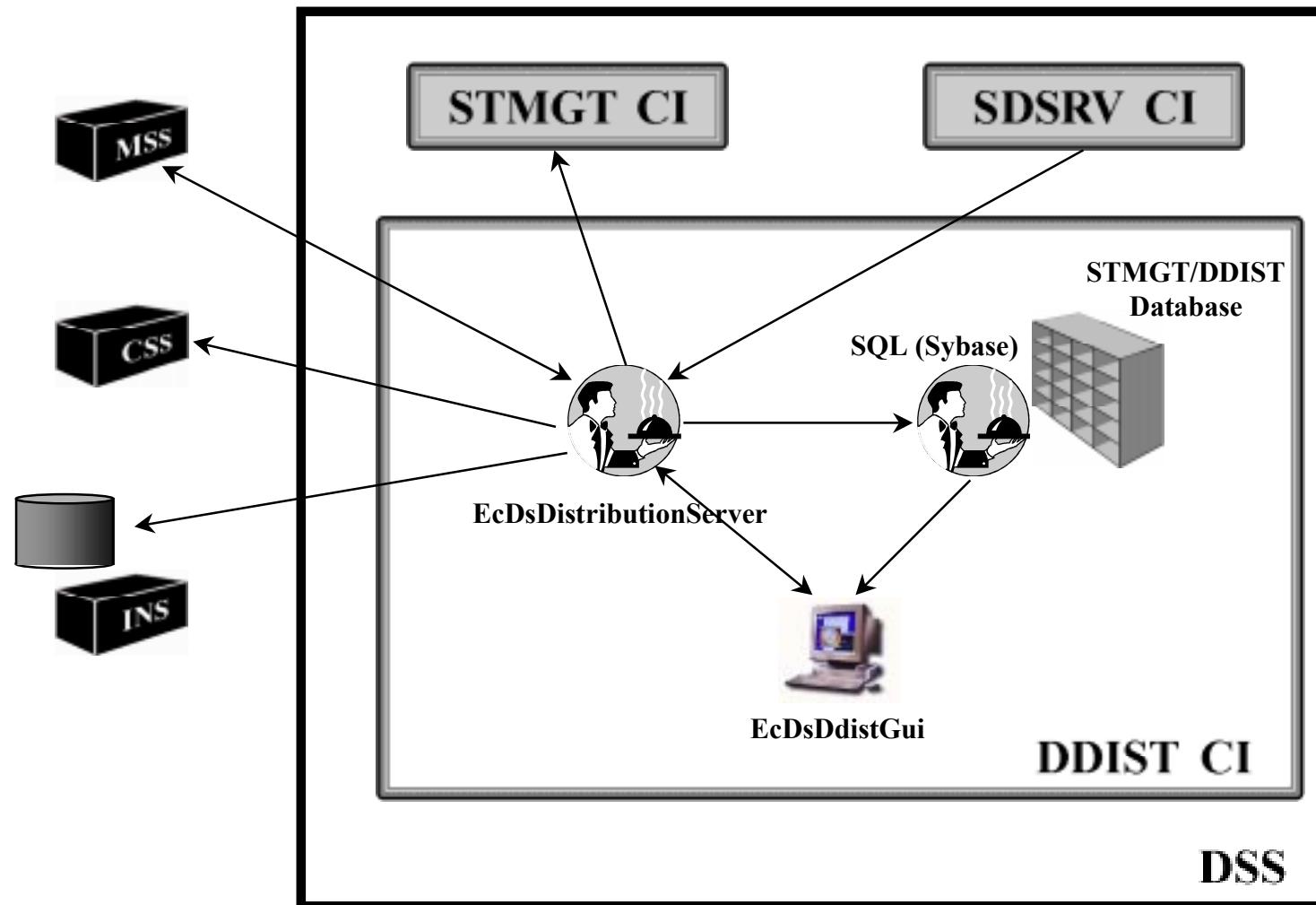
Subsystems and CSCIs: DSS (Cont.)



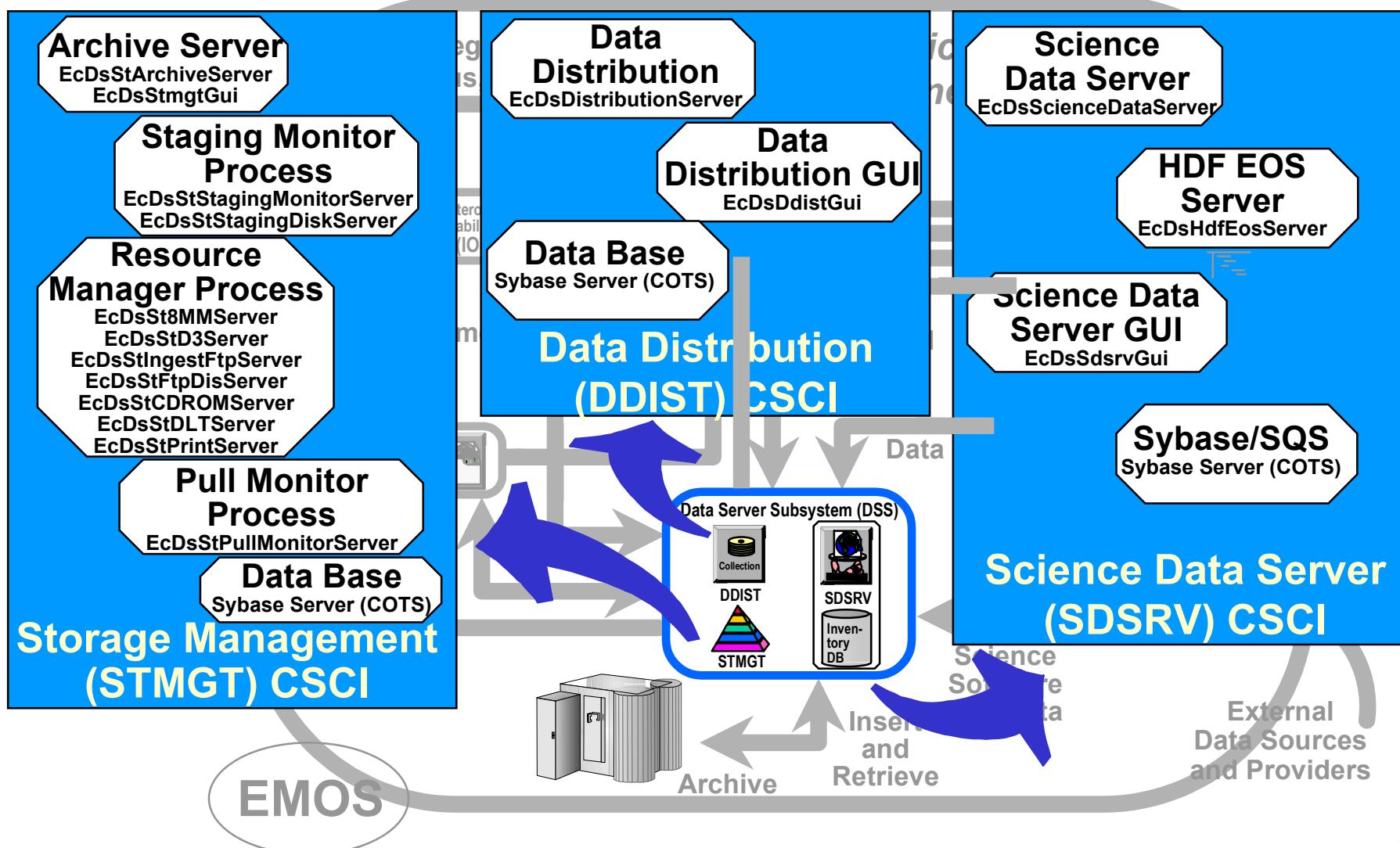
- **Data Distribution (DDIST) CSCI**
 - Formats and distributes data to users, either electronically or on physical media (e.g., 8mm tape cartridges)
 - Directs STMGT to place data in working storage, to copy data to tape, or to push data as required via FTP
 - Sends e-mail notifications
 - Three major components
 - **Data Distribution Server** - provides control and coordination for data distribution through request processing
 - **Data Distribution GUI** - allows operations staff to initiate, track, and manipulate distribution requests
 - **Data Base** - contains the request list; updates and provides the request configuration

Subsystems and CSCIs: DSS (Cont.)

DDIST Architecture and Interfaces



Subsystems and CSCIs: DSS (Cont.)



Subsystems and CSCIs: INS



- **Ingest Subsystem (INS)**



- Transfer of data into ECS (SDPS repositories) in accordance with approved ICDs
- Supports varied data formats and structures
- *Ingest Client*: A set of ingest software configured for requirements of a specific situation
- Ingest clients perform data preprocessing, metadata extraction, and metadata validation on incoming data
- Data staged to one of two areas
 - Level 0 (L0) data from ongoing missions, and EDOS ancillary data, staged to INS working storage area
 - Non-L0 data (e.g., non-EDOS ancillary data, L1A-L4 data) staged directly to DSS working storage area
- Uses several COTS tools: RogueWave class libraries, Sybase relational database, Tivoli Client, DCE Client, DCE Driver, MSAccess, HP OpenView Client

Subsystems and CSCIs: INS (Cont.)



- **Ingest (INGST) CSCI**
 - Acquires data by various methods and transfers the data into ECS
 - Automated transfer: in response to notification from the data provider, Ingest transfers the data from a specified network location
 - Polling: transfer of data from predetermined network locations which Ingest periodically checks for new data
 - With Delivery Record
 - Without Delivery Record
 - Media: reading data from tapes
 - Stores and manages request information
 - Provides for data preprocessing and insertion

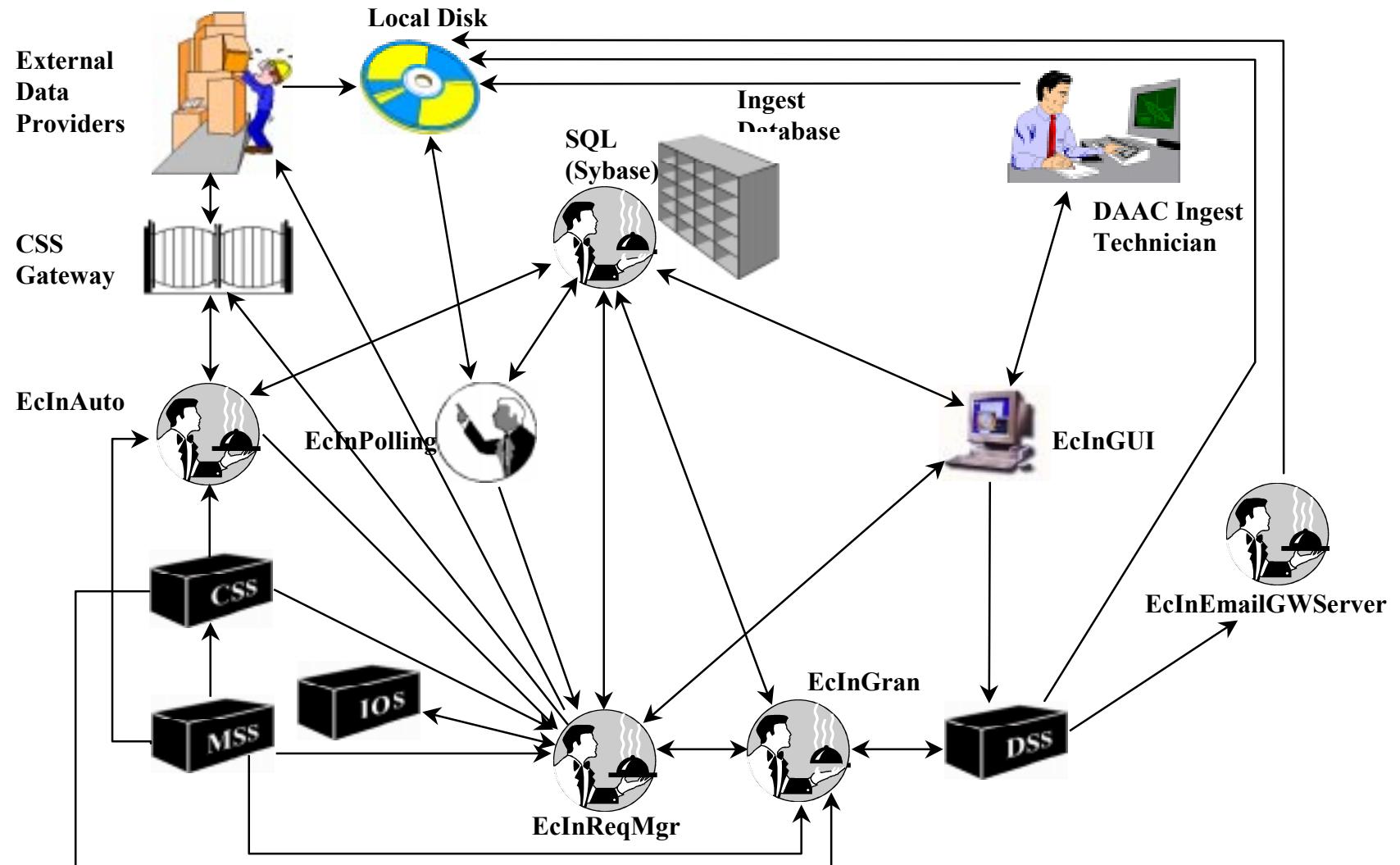
Subsystems and CSCIs: INS (Cont.)



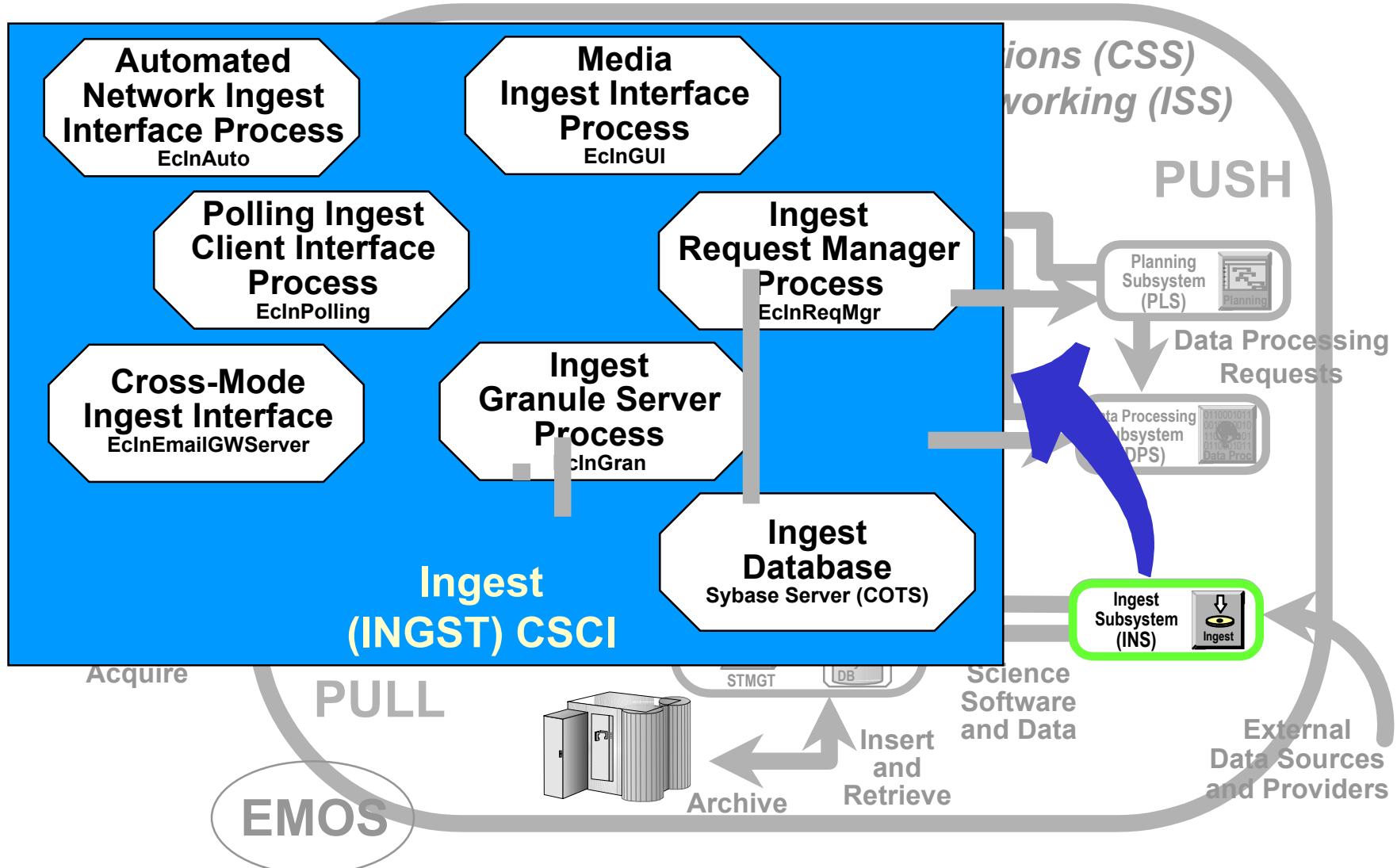
- **Ingest (INGST) CSCI (Cont.)**
 - Seven major components
 - **Automated Network Ingest Interface** - provides basic capability to ingest data electronically from an external source
 - **Polling Ingest Client Interface** - creates polling request, detects new files in a specified external location, creates and submits ingest request
 - **Media Ingest Interface** - provides operators ability to perform ingest from physical media
 - **Cross-Mode Ingest Interface** - provides an E-mail gateway server to receive distribution notifications and store them as files in a location that can be polled to create delivery records
 - **Ingest Request Manager** - manages ingest request traffic and processing
 - **Ingest Granule Server** - provides services for required preprocessing of data and subsequent insertion into Data Server
 - **Ingest Database** - stores and provides access to Ingest Subsystem internal data (e.g., History Logs)

Subsystems and CSCIs: INS (Cont.)

Architecture and Interfaces



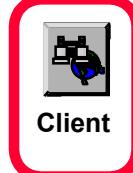
Subsystems and CSCIs: INS (Cont.)



Subsystems and CSCIs: CLS



- **Client Subsystem (CLS)**
 - User access to ECS services and data, and other systems interoperable with ECS (e.g., Version 0)
 - Search and retrieval of data are performed by the EOS Data Gateway (Version 0 Web Client)
 - Permits request of ASTER On-demand Products
 - Includes applications programs accessible through user interfaces
 - User Registration Tool (URT)
 - EOSView
 - Java Data Acquisition Request (DAR) Tool
 - On-Demand Form Request Manager (ODFRM)
 - Uses several COTS tools: Netscape Navigator, Netscape Enterprise Server, XVT (widget set and development tool for EOSView), Interactive Data Language (IDL) (used in EOSView visualization features), and Rogue Wave Tools.h++ (libraries provide strings and collections to the Java DAR Tool and User Registration Tool)



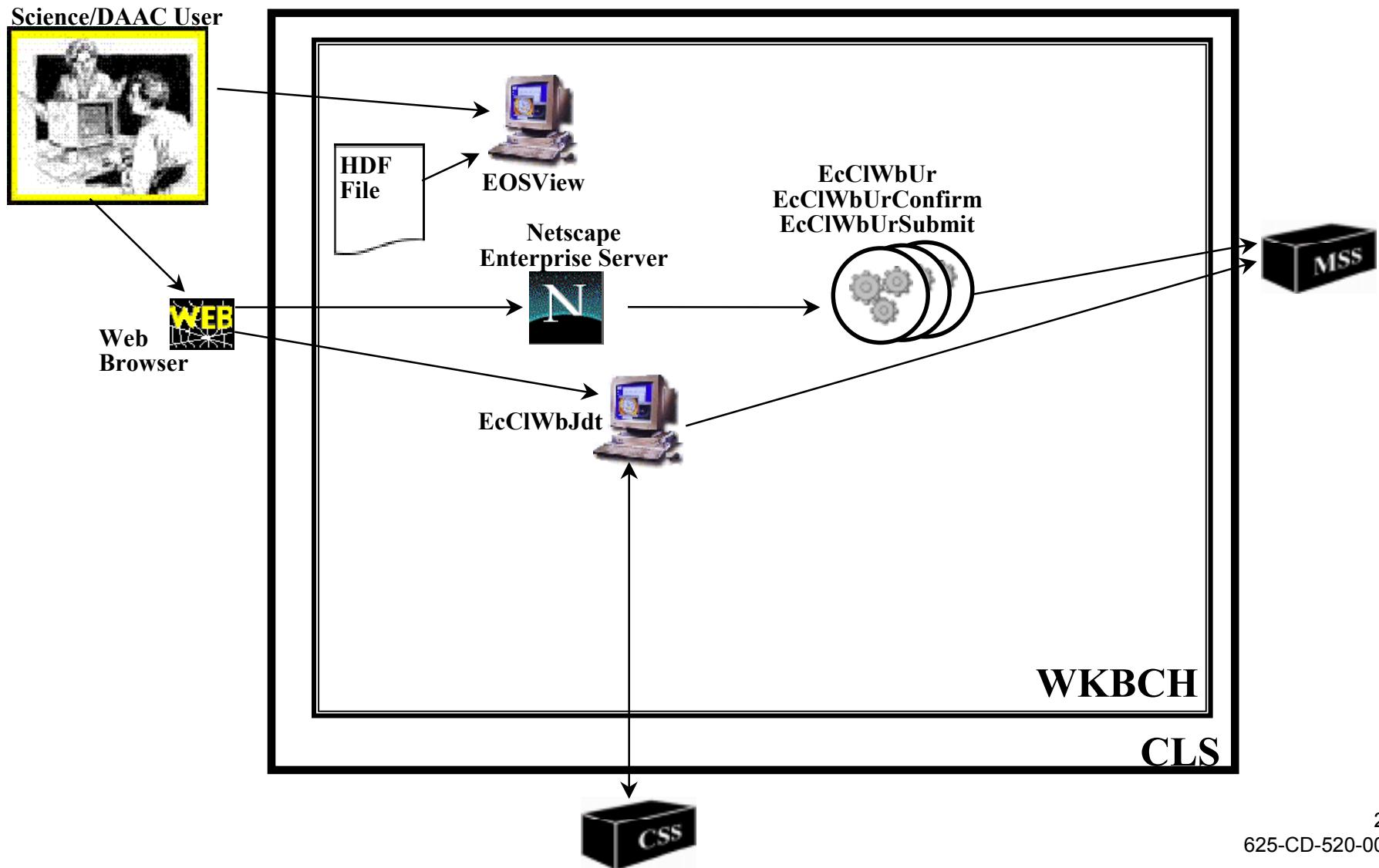
Subsystems and CSCIs: CLS (Cont.)



- **Workbench (WKBCH) CSCI**
 - Includes applications and libraries for access to ECS data and services
 - Release 5 Workbench includes 3 tools
 - [URT](#) (HTML-based)
 - [EOSView](#) (X/Motif-based)
 - Java DAR Tool (Java/HTML-based)

Subsystems and CSCIs: CLS (Cont.)

WKBCH Architecture and Interfaces



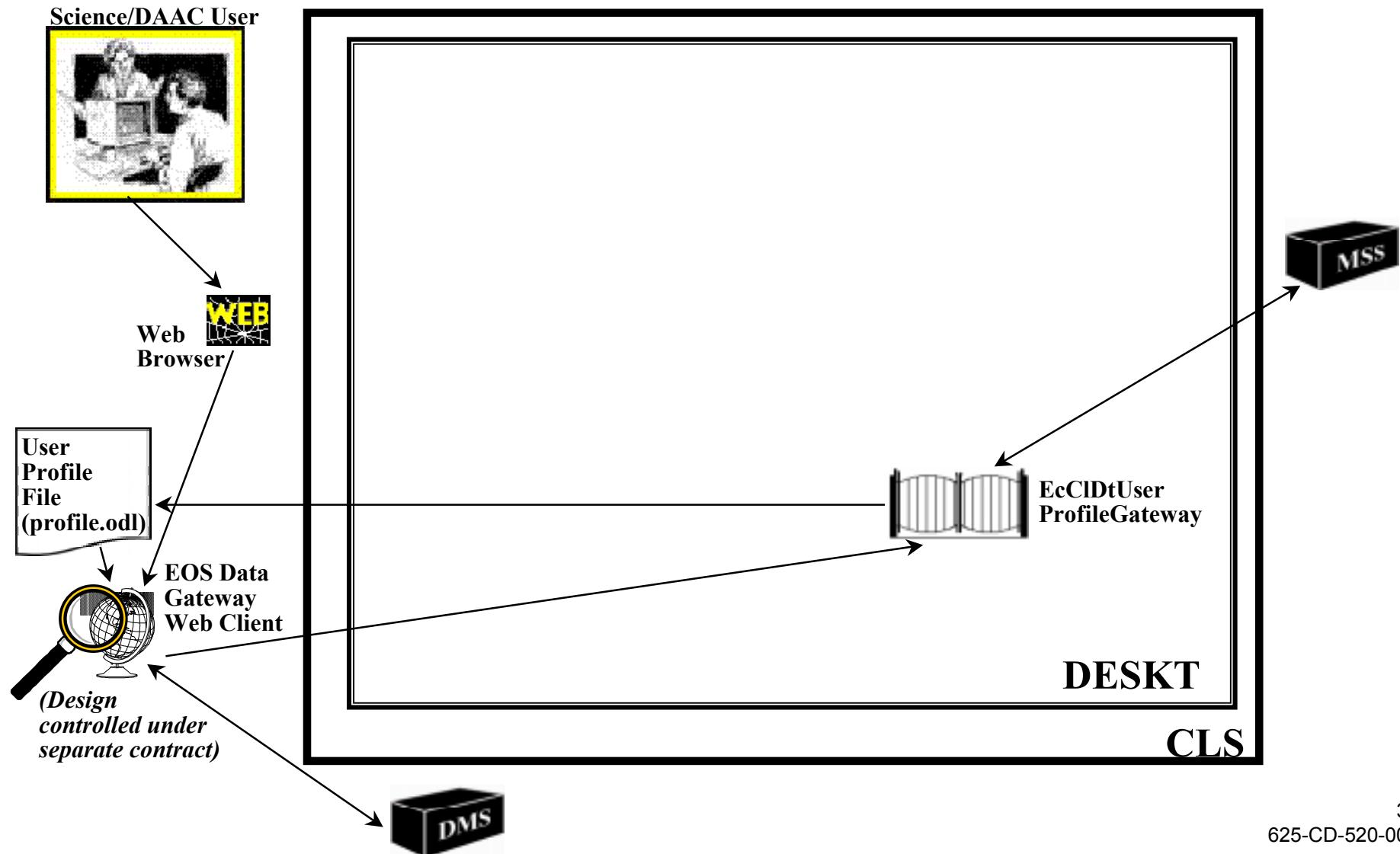
Subsystems and CSCIs: CLS (Cont.)



- **Desktop (DESKT) CSCI**
 - Provides a gateway server for communication with MSS User Registration Server to obtain user profile information
 - **User Profile Gateway** - provides user profile information to the EOS Data Gateway for ECS users
 - User authentication
 - Update user information in profile

Subsystems and CSCIs: CLS (Cont.)

DESKT Architecture and Interfaces



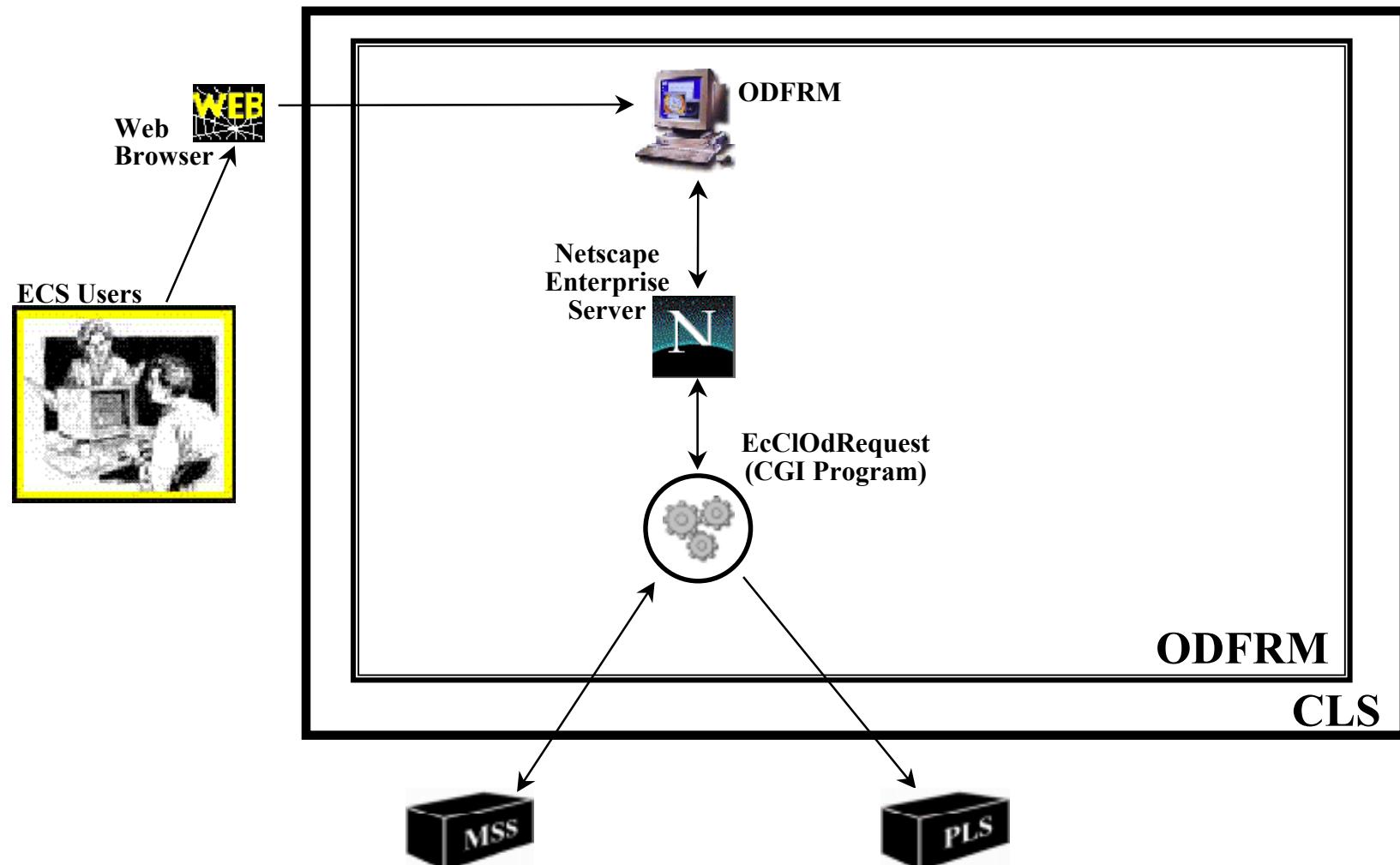
Subsystems and CSCIs: CLS (Cont.)



- **On-Demand Form Request Manager (ODFRM) CSCI**
 - ODFRM HTML pages and CGI programs
 - User creates on-demand processing request and submits it to PLS

Subsystems and CSCIs: CLS (Cont.)

ODFRM Architecture and Interfaces



Subsystems and CSCIs: CLS (Cont.)

